On July 27, at 10h. 58½m., a fine meteor, brighter than first magnitude, was doubly observed by Miss Cook at Stowmarket and by Mr. Denning at Bristol. Its heights were from 85 to 56 miles from over Hailsham to Selsey Bill on the south coast. Its path extended over 49 miles at very swift speed.

On August 7, at 10h. 37m., a brilliant Perseid, giving a vivid flash and leaving a streak for ten seconds, was seen at Bristol. It shot from 286½°−2½° to 280°−13½°, but no further observations of this fine object have yet been received. On the same night, at 10h. 10m. to 10h. 15m., a "mock moon," or Paraselene, was observed at the same altitude as the moon, and about 23° east of our satellite.

This year, moonlight has interfered with the character of the Perseid display in its earlier stages, but her lustre will not materially obscure the meteors at the period of their expected greatest frequency, on August 11 and 12, when a considerable number of observers will have been engaged in watching them if the weather was suitable.

A New Satellite to Jupiter?—In the *Times* of August 8, it is stated that "a telegram has been received announcing the discovery of a tiny object near Jupiter, which appears to be a new satellite of the planet. The discovery was made photographically by Mr. Nicholson at the Lick Observatory, Mount Hamilton, California. He reports that the new body is still fainter than the eighth satellite, which is of the seventieth magnitude, and only about forty miles in diameter, so that it can only be observed with very large instruments." It is further stated that on July 21 the new body was 6m. 41s. west of Jupiter, and on July 24, 6m. 36s. W.

Stellar Radial-velocity Observations.—In 1908 Prof. Küstner published the results of the radial velocities of ninety-nine stars of the spectral types F to M, which he determined during the period 1903 to 1908 with the three-prism spectrograph of the 30 cm. Bonn refractor. The faintest star then photographed in two hours was of the magnitude 5·2. In *Astronomische Nachrichten,* No. 4750, he publishes the radial velocities of 227 stars of the spectral type F to M which he has determined during the period 1908 to 1913, with the same refractor. In this case a new spectrograph was employed in order to continue the work to fainter stars. At the conclusion of the individual observations he compares his values, where possible, with those obtained by Prof. Campbell at the Lick Observatory: the values for 151 stars are available, and he determines the mean differences of the observed radial velocities, Lick minus Bonn, for each spectral class. These differences he regards as errors of the Bonn observations, taking into account the better observing conditions and more efficient instruments available at the Lick Observatory. Mr. J. H. Moore publishes in the Lick Observatory Bulletin, No. 257, the observations of seventeen stars the radial velocities of which vary, and also those of two stars which have large and apparent constant radial velocities. These stars are AGC 7195 and ω Pavonis of magnitudes 5·2 and 5·1 respectively. They belong to the spectral classes G and K, and the velocities derived were +184·8 and +184·4 kilometres a second respectively.

The Solar Eclipse.—The *Times* announces that a telegram has been received from Major E. H. Hills, president of the Royal Astronomical Society, stating that he and Prof. A. Fowler, who had intended going to Kieff for the purpose of observing the solar eclipse, have abandoned their project, and are on their way to St. Petersburg.

SOUTH AFRICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE twelfth annual session of the South African Association for the Advancement of Science was held in Kimberley, Cape Province, during the week commencing Monday, July 6, under the presidency of Prof. R. Marloth. There was the usual round of festivities and of visits to places of scientific or historic interest. The association meets in four sections, but in view of the increasing interest of matters pertaining to South African native races, Section D resolved to establish a subsection for African ethnology, education, history, language, and native affairs before next year's meeting in Pretoria is held.

The papers read numbered between forty and fifty, and brief outlines of the four sectional presidential addresses and some of the papers contributed by members are given below.

Dr. A. Ogg, professor of physics at Rhodes University College, Grahamstown, in his presidential address to Section A, dealt with some of the ideas in physical science which are under discussion at the present time in the light of recent research, and sought to bring under review some of our fundamental notions or principles, having regard to the fact that what mathematicians and physicists have long considered well established is now being uprooted and replaced by non-Newtonian mechanics based on the principle of relativity. Shape and mass, in fact, are looked upon as functions of velocity. Scientific thought, Prof. Ogg described as so plastic nowadays that the most cherished tenets of the last generation of men of science are being abandoned, and the greatest danger is that the meaning of the involved consequences is not always realised. As to the true physical meaning of the new ideas propounded there is much speculation, and many hold such speculations to be beyond the true scope of science. Quoting Schuster, in conclusion, Prof. Ogg said that all preferred being right to being wrong, but it is better to be wrong than to be neither right nor wrong.

In Section B the presidential address was given by Prof. G. H. Stanley, of the Transvaal School of Mines and Technology, whose subject was "A Decade of Metallurgical Progress on the Witwatersrand." The greatest advances during the last ten years, he said, were in improving methods of carrying out the various stages of the extraction processes, the essentials remaining unchanged. Sorting tables, for example, had been replaced by travelling belts, which were also elevators. Amalgamation is now carried out by flowing the tube-mill product over stationary plates, shaking plates having been discarded. Slime is now being treated more cheaply than sand; classification had greatly improved, and this, together with finer grinding, ensured that the sand residue after cyaniding contained only 0·2 of a dwt. of gold per ton. For slime treatment filtering methods were now sometimes employed, giving higher gold extraction and increased profits. Working costs had been brought as low as 3*s*. per ton.

In Section C, comprising the biological sciences and agriculture, the presidential address of Prof. George Potts, of Grey University College, Bloemfontein, dealt with rural education. South Africa, except the Rand and some coast towns, Dr. Potts pointed out, is essentially rural, and inland towns depended on the surrounding pastoral population. All grades of education should therefore be made adaptable to a rural people. The following reforms were advised:—(1) More representation for agriculture and the natural sciences on the University Council; (2) encouragement of the study of natural science in university colleges; (3) appointment of additional school inspectors specially qualified

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to deal with nature-study and science teaching; (4) more teaching of nature-study, school gardening, botany, and zoology at the training colleges; (5) a more liberal matriculation, allowing of two natural sciences alternatively to Latin and mathematics; (6) more biology in secondary schools; and (7) systematic and correlated nature-study and school gardening in the primary schools.

Prof. W. Ritchie, of the South African College, and Vice-Chancellor of the University of the Cape of Good Hope, presided over Section D, and in his inaugural address discussed "Some Aspects of Language Study." Comparing the science of language with the other branches of natural science, he showed the disadvantage of the former in that it lacks actual objects capable of being handled and experimented with. The spoken word perishes, and cannot be retained as a labelled specimen for investigation at leisure, so that the student of a thousand years hence, with no data regarding the English language save its written symbols, would be unable to reconstruct from these the exact vocal sounds which they represent for us. Fortunately specimens of vocal sounds may now be stored away for reference by means of the gramophone, and even the records now being produced for mere amusement may thus aid the objects of science. Some European countries already possess large collections of records showing distinctive features of various dialects, and it may be feasible with every census of population thus to provide for a census of language. In South Africa there is an amazingly wide field open for investigation; in English, with its varieties of local intonation; in Dutch with its three recognised forms; and in the numerous native languages, in regard to which an endless amount of work yet remains undone. The institution of a chair of phonetics was therefore suggested, and next in importance would be chairs for the systematic study of the country's aboriginal languages. Then chairs of ethnology should be added, and all this calls for speedy attention, as witness the opportunities passing, never to be recalled, with the fast disappearing Hottentots and their curious and interesting language and ethnological connections.

Of the papers read at the sectional meetings, in Section A a great deal of interest attached to a series of spectrographic investigations of the N'Kandhla meteorite and other meteoric irons by Dr. J. Lunt, of the Royal Observatory, near Cape Town. Several measurements of wave-lengths demonstrated that the lines observed were yielded by cobalt, nickel, chromium, iron, and barium. No evidence was found of the presence of magnesium, platinum, or copper. Mr. E. Jacot contributed the results of experiments made at the South African College with respect to atmospheric radio-activity. The activity of a wire charged with a high negative potential was least after rain and highest after S.E. winds. Per unit volume of air there was 28,000 times as much of the emanation of radium as of thorium.

In Section B Dr. W. Johnson contributed a paper embodying further experiments made by him in regard to the origin and formation of the diamond, which, he is convinced, could not possibly have taken place in a rock in molten condition. "The lost land of Agulhas" was the subject of a paper by Prof. E. H. L. Schwarz, whose theory is that the flagstones and clay slates of the Cape Peninsula were formed by denudation from a now submerged land to the south of the present continent. Four papers on geological subjects were submitted by Dr. W. Versfeld, the most important of which was one which recently gained him his doctorate from the Cape University—"The Geological Structure of Parts of German South-West Africa." Dr. C. F. Juritz read a paper on the investigation of plant poisons in South Africa, detailing the results of numerous analyses, many of which indicate active principles new to science. The great importance of systematically investigating this subject was urged. Another instructive paper, by Mr. C. Williams, dealt with the chemical control of cattle-dipping tanks.

The Rev. J. A. Winter contributed to Section C a suggestive paper on native medicines, and urged that the Agricultural Department should devote its attention to the indigenous plant remedies employed by "Kaffir doctors." Dr. Perold and Mr. Crawford contributed a comprehensive series of analyses of vineyard soils from the Montagu and Robertson districts. Mr. F. W. FitzSimons detailed the results of experiments with banana stem juice and other alleged snake-bite remedies, all of which failed to produce the curative effects ascribed to them.

Several papers in Section D were devoted to native manners and customs. The Rev. W. A. Norton dealt with the study of the South African native languages, and in the course of his address he pleaded earnestly for a scientific study of comparative Bantu. Miss Wilman exhibited a magnificent collection of actual-size reproductions of Bushman paintings and rock engravings. The Rev. J. R. L. Kingon, of the U.F.C. Mission, Somerville, contributed a paper on the emergence and progress of the Transkeian natives, ascribing to the passing of communal land tenure, *inter alia,* the vast change that was taking place. He emphasised the desirability of instituting individual tenure, so that economic pressure, supplemented by the establishment of a native university, might complete the improvement in the status of the natives who were being rapidly Christianised. The Rev. Noel Roberts submitted a paper on the practice of the To-Kolo system of divination amongst the natives of the northern Transvaal, and a contribution by Mr. H. W. Garbutt on the resemblance between the utensils of the ancient Egyptians and those found in Northern Rhodesia was likewise of great interest. Mr. Garbutt also contributed some notes on the natives of Rhodesia. "The mental and moral capacity of our natives" was exhaustively dealt with by the Rev. J. A. Winter, who has resided for fifty years amongst the natives of eastern Transvaal.

Other papers of interest read in Section D included suggestions for the constitution of an Upper House of Parliament, by Dr. A. H. Watkins, the main suggestion being that admission to the franchise be restricted to persons of advanced years. A valuable paper on South African place-names was read by the Rev. Charles Pettman, and one equally valuable, although in a totally different sphere, was given by Dr. T. B. Muller on some defects common to epistemological idealism and realism.

An evening discourse was delivered in the Kimberley City Hall on Friday, July 10, by Prof. E. H. L. Schwarz, on the Kimberley diamond pipes, the history of their discovery, and their relation to other South African volcanic vents. This lecture, like Prof. Marloth's address as president of the Association on Wednesday, July 8, was illustrated by many lantern slides. The numerous slides exhibited by Prof. Marloth were all exquisitely hand-coloured, and constituted without doubt the most excellent collection representative of South African indigenous flora ever exhibited. They were specially prepared by Dr. Marloth for this occasion. At the conclusion of the president's address, Dr. Crawford, the association's senior vice-president, handed to him the South Africa medal (instituted by the British Association in 1905 in commemoration of its visit to South Africa during that year) and grant of 50*l.* which had been conferred upon him in recognition of his eminent services to botanical science in South Africa during the last thirty years.

C. F. J.

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